

Observations of Ozone and Carbon Monoxide in the Troposphere over the Southern US Measured by TES

Gregory Osterman¹ and the TES Science Team

¹Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; ²NASA Langley Research Center, VA



Introduction

The Tropospheric Emission Spectrometer (TES) on the NASA EOS-Aura spacecraft has been making global measurements of ozone, carbon monoxide and atmospheric quantities in the troposphere since September 2004.

► The standard measurement mode for TES is the global survey where nadir measurements are made with a separation of $\sim 1.3^\circ$ in latitude (~ 180 km)

► Over the course of the mission TES has made an extensive set of special observations called "Step & Stares" with a finer spatial resolution ($\sim 0.4^\circ$ separation in latitude or ~ 40 km)

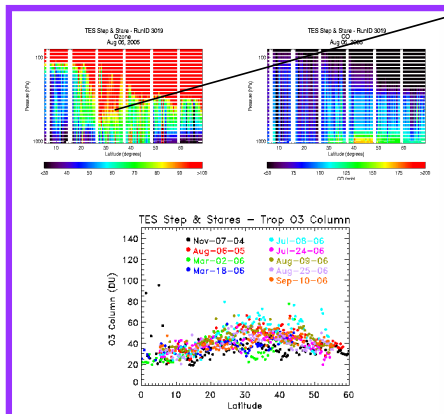
► The special observations were designed to enhance spatial coverage over regions of interest during validation/science campaigns such as INTEX-B, Texas-AQS, WAVES and the AVE missions. A large set of Step & Stare measurements targeting the continental United States and the Atlantic ocean were made from July-October 2006 for use in science studies

► This work (in the preliminary stages) looks at geographic regions targeted repeatedly by the TES Step & Stare observations and tries to use the improved spatial resolution of the special observations to characterize regions of high ozone in the middle and lower troposphere. Specifically:

► The region of high ozone over the Atlantic off the southeastern United States in the Summer/Fall 2006

► The Gulf of Mexico including the southern US.

► We will use the TES special observations and global surveys to give a description of both background conditions in this region and an examination of polluted regions.



TES Special Observations Over Central US and Gulf of Mexico

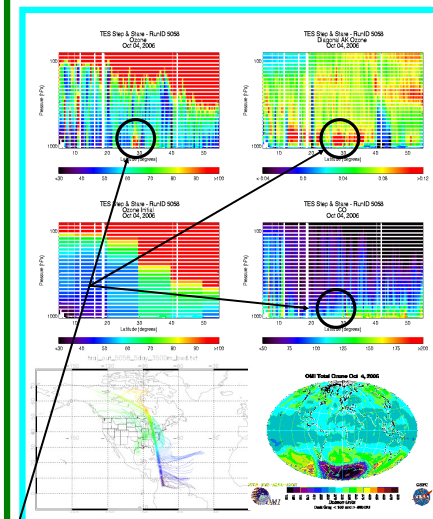
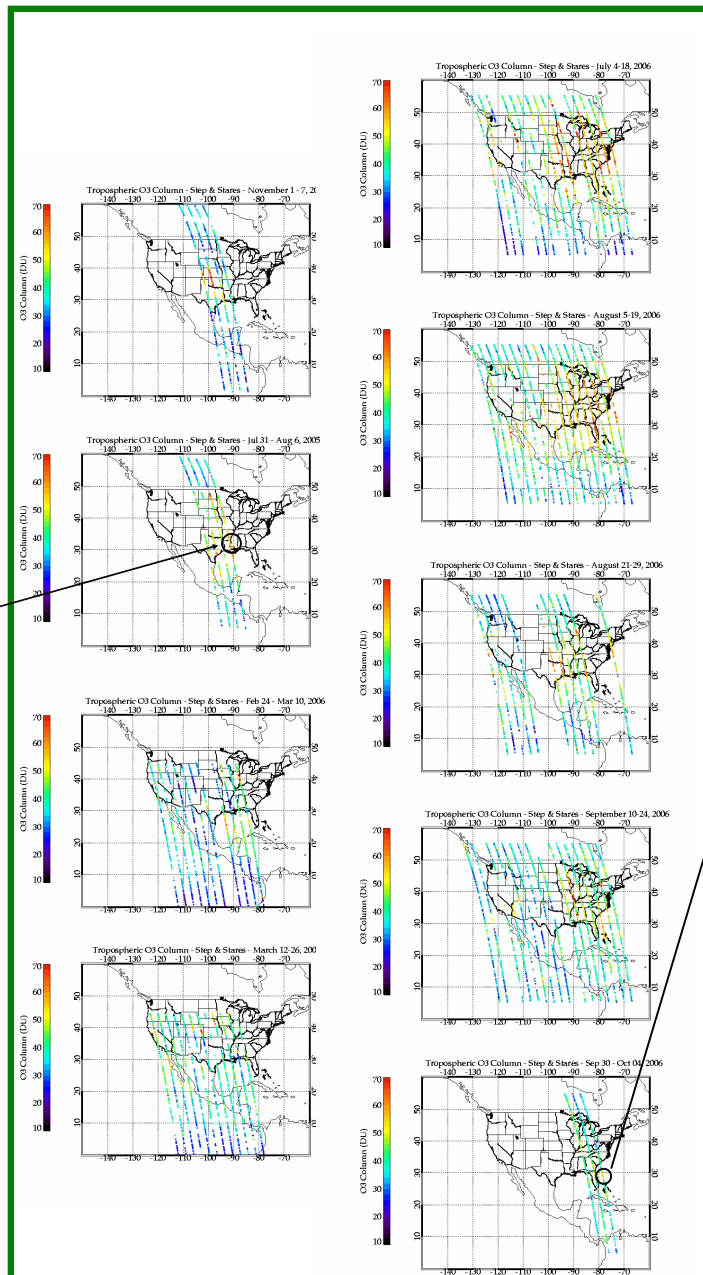
► Full analysis of these observations is underway in a variety of studies relating to Texas AQS and MILAGRO/INTEX-B

► Plan to examine the pathways for pollution flow over the Gulf of Mexico using techniques similar to those of Li et al. 2005, Cooper et al. 2005

TES Tropospheric Column Ozone from Step & Stares

► Special observations were made over the entire continental US for the time periods: March 2006, July – September 2006 (slightly different latitude regions)

► A subset of special observations over the central US and western Gulf of Mexico were made in November 2004, August 2005



Lower Troposphere Ozone

► TES is able to see small plume of elevated ozone off the coast of Florida and resolve it in the lower troposphere

► Future work will be to characterize the changes in ozone off the SE coast of the US by examining the vertical distribution and using the measurements of other trace gases by TES and OMI.